Summary Report of the World Trade Center Technical Review Panel Meeting

October 5, 2004

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NOTICE

This report was prepared by Eastern Research Group, Inc., an EPA contractor, as a general record of discussion held during the seventh meeting of the World Trade Center Technical Review Panel held October 5, 2004 at St. John's University. This report captures the main points and highlights of the meeting. It is not a complete record of all details discussed, nor does it embellish, interpret, or enlarge upon matters that were incomplete or unclear. Statements represent the individual view of each meeting participant, and may or may not represent the analyses or positions of EPA.

CONTENTS

ACRONYMS

CBPR	Community-Based Participatory Research
COPC	contaminant of potential concern
EPA	U.S. Environmental Protection Agency
FDNY	Fire Department of New York
FEMA	Federal Emergency Management Agency
GAO	Government Accountability Office
HEPA	High-Efficiency Particulate Air
HVAC	heating, ventilation, and air conditioning
NYC	New York City
ORD	Office of Research and Development
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbon
UCL	upper confidence limit
USGS	U.S. Geological Survey
WTC	World Trade Center

EXECUTIVE SUMMARY

After the collapse of the World Trade Center (WTC) and the subsequent release of contaminants into the environment, the U.S. Environmental Protection Agency (EPA), other federal agencies, New York City (NYC), and New York State public health and environmental authorities focused on numerous cleanup, dust collection, and ambient air monitoring activities to ameliorate and better understand the human health effects of the disaster. While these monitoring and assessment activities were ongoing, EPA began planning for a program to clean and monitor residential apartments. Residents impacted by the WTC dust and debris were eligible to request federally funded monitoring and/or cleaning of their residences. The cleanup continued into the summer of 2003, by which time EPA had cleaned and monitored 3,400 apartments and monitored an additional 800 apartments.

Since then, EPA convened a technical panel of experts who have been involved with the WTC assessment activities to provide advice on the effectiveness of these and related programs. Paul Gilman, EPA Science Advisor, serves as the chairperson, and Paul Lioy, Professor of Environmental and Community Medicine at the Environmental and Occupational Health Sciences Institute of the Robert Wood Johnson Medical School-UMDNJ and Rutgers University, serves as vice chair. This report summarizes the seventh technical panel meeting in New York City, held at St. John's University in Saval Auditorium on October 5, 2004.

Dr. Gilman facilitated the meeting and presented the agenda, which consisted of:

- Welcome, Purpose of Today's Meeting, and Opening Remarks
- Report from Community Participation Committee
- Report from Signature Subgroup
- Overview Presentation of Revised Sampling and Analyses Proposal
- Morning Panel Discussion
- Morning Public Comments/Question-and-Answer Session
- Afternoon Panel Discussion
- Human Health Effects Panel
    - Analyses of WTC Dust Plume
    - Asthma in New York City's Chinatown After 9/11
- Briefing on GAO Testimony on September 11: Health Effects in the Aftermath of the World Trade Center Attack
- Afternoon Public Comment/Question-and-Answer Session
- Adjourn

Individual panelists proposed the following key conclusions and suggestions during the meeting:

- The Community Participation Committee called upon EPA to publicly commit itself—in a written statement released at a press conference presided over by an official EPA spokesperson—to seven principles.
- Several panelists encouraged EPA and the community to meet before the next panel meeting.
- The Signature Subgroup needs background samples to validate the WTC signature.

- A panelist suggested that, if the signature is not validated, EPA should return to the idea of using concentric circles to identify areas of cleanup.
- Several panelists stressed the importance of having clear language in the proposed monitoring program and suggested asking a communications expert to review the draft.
- The panelists agreed that public health outreach and education are essential to the monitoring program.
- Two panelists suggested verifying that three times background is an appropriate benchmark.
- Most panel members did not think that air sampling would be the more protective sampling method over dust sampling, since the WTC attack occurred three years ago. Further, air sampling is more intrusive to the resident.
- Two panelists proposed two different methods for deciding whether health-based benchmarks or three times background levels should be the decision criteria for unit cleanup:
    1) Choose the more protective (i.e., lower) benchmark.
    2) Use a health-based benchmark when available and use three times background levels when a health-based benchmark is not available.
- Two panelists agreed that occupational benchmarks should not be used as cleanup criteria.
- The community clarified for the panel that the Department of Health does not sponsor cleanups for lead exceedances.
- One panelist firmly believes that if contamination is found at harmful levels, even if it is unrelated to the WTC, the unit should be cleaned. He also thought that cleanup could be offered to anyone who wants it, even if sampling does not indicate a problem.
- One panelist presented data from the Department of Health on blood lead levels and dust lead levels in Lower Manhattan as evidence to include lead as a WTC contaminant of potential concern (COPC). Based on this information, members of the panel agreed that, if lead levels exceed the cleanup criteria and if the validated WTC signature is present, the unit should be cleaned up.
- Even though the community does not want to allow sampling without clear decision guidelines, EPA will not know exactly what the next steps will be until the data are collected and analyzed. One panelist suggested that EPA, the panel, and the community discuss next steps in an open forum, after the data are collected.
- Two panelists recommended re-evaluating Brooklyn as part of Phase II.
- With some minor modifications, Lioy encouraged EPA to release a revised draft of the proposed monitoring program to the community for their review.
- Several panelists did not think that endotoxins could be included in the WTC signature because they are naturally found in all dust and have been increasing in concentrations since 9/11.
- Several panelists thought that the GAO report was incomplete because it did not include several key studies.
- One panelist pointed out that many workers and volunteers are having difficulty receiving medical treatment and this should be a concern for the panel as an unmet public health need.
- Three panelists discussed the importance of having homeland security mechanisms in place (at the local level) to minimize the potential for casualties during the next event.

1. INTRODUCTION

After the collapse of the World Trade Center (WTC) and the subsequent release of contaminants into the environment, the U.S. Environmental Protection Agency (EPA), other federal agencies, New York City (NYC), and New York State public health and environmental authorities focused on numerous cleanup, dust collection, and ambient air monitoring activities to ameliorate and better understand the human health effects of the disaster. While these monitoring and assessment activities were ongoing, EPA began planning for a program to clean and monitor residential apartments. Residents impacted by the WTC dust and debris were eligible to request federally funded monitoring and/or cleaning of their residences. The cleanup continued into the summer of 2003, by which time EPA had cleaned and monitored 3,400 apartments and monitored an additional 800 apartments. Since then, EPA has been developing a draft sampling plan to study the contamination and recontamination of spaces in lower Manhattan that may have been contaminated by the WTC disaster.

EPA convened a technical panel of experts who have been involved with the WTC assessment activities to provide advice on the effectiveness of these and related programs. Paul Gilman, EPA Science Advisor, serves as the chairperson, and Paul Lioy, Professor of Environmental and Community Medicine at the Environmental and Occupational Health Sciences Institute of the Robert Wood Johnson Medical School-UMDNJ and Rutgers University, serves as vice chair. Members of the panel include representatives from the federal agencies directly involved in the air quality response and monitoring, the NYC Departments of Health and Environmental Protection, and outside experts.

EPA's goals in forming this panel and holding the current and planned meetings are:

- To obtain more input on ongoing efforts to monitor the situation for New York residents and workers impacted by the collapse of the WTC.
- To help guide EPA's use of the available exposure and health surveillance databases and registries to characterize any remaining exposures and risks, to identify any unmet public health needs, and to recommend any steps to further minimize the risks associated with the aftermath of the WTC attacks.

Seven technical panel meetings and one conference call have been held to date:

- March 31, 2004, at the Alexander Hamilton U.S. Customs House
- April 12, 2004, at the Tribeca Performing Arts Center at the Borough of Manhattan Community College
- May 12, 2004, conference call
- May 24, 2004, at Saval Auditorium at St. John's University
- June 22, 2004, at Saval Auditorium at St. John's University
- July 26, 2004, at Saval Auditorium at St. John's University
- September 13, 2004, at Saval Auditorium at St. John's University
- October 5, 2004, at Saval Auditorium at St. John's University

3

This report summarizes the presentations and panel discussions at the October 5, 2004 technical panel meeting. Information on each of these meetings is provided on EPA's Web site (http://www.epa.gov/wtc/panel).

1.1 Panel Attendees

The following panel members were not present at this technical panel meeting:

- Patricia Clark
- Frederica Perera
- Claudia Thompson

Gil Gillen served as an alternate for Patricia Clark. Ms. Gillen is the Occupational Safety and Health Administration (OSHA) Region 2 Assistant Regional Administrator for Federal/State Operations. A complete list of WTC expert technical review panel members is available on EPA's Web site (http://www.epa.gov/wtc/panel/members.html).

1.2 Purpose and Agenda

The purpose of this technical panel meeting was to:

- Review the status of a sampling proposal (refined based on input from the September 13 meeting)
- Provide an update on the WTC signature validation study
- Continue to brief the panel members on current public health studies related to WTC impacts

The agenda for this meeting is provided in Attachment A and covered the following topics:

- Welcome, Purpose of Today's Meeting, and Opening Remarks
- Report from Community Participation Committee
- Report from Signature Subgroup
- Overview Presentation of Revised Sampling and Analysis Proposal
- Morning Panel Discussion
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2. WELCOME, PURPOSE, AND OPENING REMARKS

Paul Gilman, EPA Science Advisor

Dr. Gilman welcomed the participants, reviewed the agenda for the meeting, asked for comments, and introduced Catherine McVay Hughes for the first presentation.

3. REPORT FROM COMMUNITY PARTICIPATION COMMITTEE

Catherine McVay Hughes, Community Liaison

Ms. McVay Hughes presented a report from the Community Participation Committee reflecting the results from a meeting held on September 29, 2004. She said that the committee continued to work with EPA to finalize the statement of work and budget for the Community-Based Participatory Research (CBPR) process, discussed selecting a WTC Community Facilitator Outreach Assistant, and organized an evening community meeting to discuss unmet health needs. They were unable to review the *Draft Proposed Monitoring Program to Determine Extent of WTC Impact* because it was not available before the meeting.

The Community Participation Committee identified three main community concerns:

- *Process*. The community would like the agenda for the monthly meetings to be released at least one week prior to the meetings. They are also concerned that not enough time is allotted for responding to information received by EPA. For the seventh time, the community is requesting transcripts of the monthly panel meetings.

- *Sampling Proposal*. The community would like the sampling program and signature study to occur simultaneously. They also request that the trigger for cleanup be the more protective standard between health-based benchmarks and background levels. McVay Hughes said that the community is concerned that EPA will release a draft of the proposed monitoring program to the Federal Register before reaching an agreement with the community.

- *Unmet Public Health Needs*. The community is concerned about the 9/11-related cleanup, demolition, and construction at the following three sites:

    — *Deutsche Bank (130 Liberty Street)*. An Initial Building Characterization Study Report for Deutsche Bank consistently found five contaminants of potential concern (COPCs) at levels above the available criteria: asbestos, dioxins, lead, polycyclic aromatic hydrocarbon, (PAH), and crystalline silica/quartz. The community requests that the Lower Manhattan Development Corporation present a data report at the November 2004 panel meeting. They "demand" that EPA be the lead agency to ensure that measures are taken to properly contain the contamination.

    — *Fitterman Hall (30 West Broadway)*. The community requests a presentation at the November 2004 panel meeting, on the status of the demolition activities at Fitterman Hall.

— *130 Cedar Street*. A boarded-up 12-story building is located at 130 Cedar Street, between the Deutsche Bank and 90 West Street. The community is concerned that environmental hazards exist because it is not evident that cleanup has occurred. The community requests that EPA obtain and share information about any sampling or cleanup that has occurred at this location.

The Community Participation Committee expressed appreciation to the WTC panel, but then called upon EPA to publicly commit itself in a written statement released at a press conference presided over by an official EPA spokesperson to the following seven principles:

1) EPA will conduct, with appropriate input from the community, comprehensive indoor environmental testing for multiple contaminants. The testing will occur as promptly as possible.

2) EPA will expand the geographic range of the testing from its original boundaries to include, at a minimum, additional southern Manhattan communities, including all of Chinatown, and also the neighborhoods in Brooklyn impacted by World Trade Center dust.

3) EPA will test both residences and workplaces. Landlords, residents, employers, and employees will all be given the option of volunteering to have their respective buildings, residences, and workplaces tested.

4) EPA testing will include mechanical ventilation systems.

5) Where test results warrant, EPA will decontaminate not only the tested buildings but the neighborhoods affected by 9/11 contaminants. The cleanup clearance criterion for each identified contaminant will be based upon consideration of health-based benchmarks and background levels, utilizing the criterion that is more protective.

6) EPA will, with appropriate community input, take the lead role in supervising the environmental safety of all 9/11-related cleanup, demolition, and reconstruction activities.

7) As EPA evaluates unmet health needs resulting from the attacks, it will support all necessary national and local efforts to ensure public health education, outreach, and long-term medical follow-up for affected communities and to ensure medical care for affected individuals.

Panel Discussion

Gilman expressed concern that EPA is not invited to attend the community meetings. David Newman did not think it would be comfortable for community members to have frank, open discussions if EPA were present. Jeanne Stellman suggested that since every EPA meeting is not

open to the community, perhaps both the community and EPA should have their own meetings, but then come together in a third forum between panel meetings to discuss outstanding issues.

Lioy reiterated that the panel was not designed to reach consensus. However, many of the seven principles have been discussed at the meetings and some have been agreed on by the panel. He recommended that the Community Participation Committee engage in direct communication with EPA to discuss publicly announcing and committing to the seven principles. David Prezant talked about some specific instances in which the panel has discussed the seven principles, for example, using the more protective value between a health-based benchmark and background level.

Morton Lippmann thought that the seven principles went beyond the charge of the panel. However, Gilman and Lioy commented that EPA would like the panel's help in determining a well-defined sampling plan and criteria to evaluate the potential for cleanup, especially as it relates to benchmarks. Lioy said that since the Federal Emergency Management Agency (FEMA) and NYC are responsible for implementing the cleanup, the actual *implementation* is beyond the scope of the panel. He did mention that the panel should evaluate the results of the cleanup to provide quality assurance. Newman also thought that it was appropriate for the panel to be involved, as it relates to an unmet public health need.

Lioy agreed that the Deutsche Bank building demolition presents a public health concern. He recommended engaging all the involved agencies to make sure that the demolition is completed properly. Newman stated that he submitted a Freedom of Information Act request to the Dormitory Authority for the State of New York for Fitterman Hall. He would also like EPA or another agency to request the data for Fitterman Hall.

4. REPORT FROM SIGNATURE SUBGROUP

Greg Meeker, U.S. Geological Survey (USGS) Research Geologist
Nancy Adams, EPA Office of Research and Development (ORD), National Homeland Security Research Center

Nancy Adams said the Signature Subgroup is developing chemical/physical signatures for dust from the WTC building collapse and ensuing fires. Dust samples recently collected in the NYC area are being used in developing the WTC dust signatures. The proposed dust signatures will be validated through challenge with 10 recently collected dust samples from WTC-contaminated sites and 10 dust samples from outside the plume.

Greg Meeker explained that the Signature Subgroup has analyzed two additional samples since the last panel meeting. He said that they have enough bulk samples, but could use the community's help in obtaining "critical" background samples that are needed to validate the signature. One community member suggested that members of the panel help obtain the background samples, since several are associated with organizations that own many buildings outside the plume area.

Dr. Adams said that dust samples were collected and analyzed from Deutsche Bank in August 2004. The PAH ratios indicated that the WTC fire signature was evident. She said that access

was granted to 4 Albany Street, that they are currently seeking access to Fitterman Hall, and will try to gain access to 130 Cedar Street. A community member offered to give Dr. Adams contact information for Fitterman Hall. Dr. Adams stressed the importance of obtaining eight additional background samples and seven additional WTC-contaminated samples to help advance the cleanup planning effort.

In response to a question from a community member, Dr. Adams said that she has reviewed some of the data furnished by the R.J Lee Company from the Deutsche Bank study; this study contains tens of thousands of dust analyses. Also in response to a question from a community member, Dr. Adams stated that a statistically significant validation of the proposed WTC dust signature could be accomplished with the 20 samples (10 contaminated samples and 10 samples from outside the plumes).

Panel Discussion

Stellman wondered what EPA's policy would be if 100 percent specificity is not determined for the signatures. Some panel members agreed that it is not realistic to expect the signatures to be 100 percent specific or sensitive. Lippmann said that because the levels represent a range, not an absolute number, some of the decisions will have to rely on professional judgment. To alleviate community concerns and credibility issues, Stellman and Prezant suggested that the panel make recommendations about cleanup criteria for cases that are not clear cut. Lioy said that the additional samples being collected for the signature study will help reduce the range of uncertainty. Gillen also commented on the importance of developing a WTC signature.

Peter Gautier commented on the importance of validating the signature, both for defining the extent of the plume and for triggering cleanup. Newman wondered what would happen if the signature is not validated, but there are COPC exceedances. Prezant suggested returning to the idea of using concentric circles (taking into account the varying distributions for large and small particles) to identify areas of cleanup, if the signature is not validated. Meeker commented that his confidence in the signature has increased since the last panel meeting.

Stellman was concerned that the signature study would delay actual sampling, further adding to the community's frustrations. However, Lioy explained that both the sampling and the signature study will progress simultaneously. He also reiterated that no one intends for the signature study to be a multiple-year research project. Meeker confirmed that the signature study has not delayed any other ongoing processes. However, he noted that if background samples are not identified and collected soon, they could be in a situation where the signature study is being delayed. Prezant and McVay Hughes explained that the community (i.e., individual homeowners and residents), corporations, and government agencies all have the same concern about allowing testing before there is a clear understanding or plan for remediation. They are hesitant to allow sampling without first defining the benchmarks that would trigger a cleanup action.

Lippmann commented that the fire signature was being "neglected." Lioy expressed concern over whether the PAH signature for WTC smoke is stable enough to survive over time. He suggested that EPA compare work done by his group with the proposed PAH signature.

5. OVERVIEW PRESENTATION OF REVISED SAMPLING AND ANALYSIS PROPOSAL

Paul Gilman, EPA Science Advisor

Dr. Gilman said that EPA wishes to obtain input from the community and the panel to create a "firm draft" that can then be posted in the Federal Register for a formal public comment period. EPA would specifically appreciate input on the following:

- Sampling methods (e.g., High-Efficiency Particulate Air (HEPA) vacuum and a newly proposed passive air sampling approach)
- Cleanup criteria
- Decision criteria for broad cleanup activities
- Criteria for expanding the geographic sampling area during Phase II
- What to do if the signature study cannot be validated

The objectives of the proposed monitoring program are to estimate the geographic extent of WTC contamination, to provide data to determine if a Phase II is necessary, and to validate a method to identify a signature for WTC dust and/or combustion products. Dr. Gilman noted that it is important to obtain a sufficient number of buildings, however, only a statistically valid subset of the buildings will be sampled. Asbestos, man-made vitreous fibers, PAHs, silica, and lead were included as COPCs. Dioxin and mercury were not included because of their low exceedance rates during the 2002 EPA Indoor Air Cleanup Program.

Substantial changes to the monitoring program include:

- No air sampling.

- Three options for developing COPC cleanup criteria: health-based benchmarks, three times WTC background levels, or occupational benchmarks.

- Decision criteria for unit cleanup:
  - Cleanup will occur if the validated signature is present and there is at least one exceedance of a cleanup benchmark.
  - Cleanup will not occur if either the validated signature is missing or none of the COPCs exceed the cleanup benchmark.

- Decision criteria for building cleanup:
  - Cleanup will occur if the 95 percent upper confidence limit (UCL) on the mean of all measurements in the building associated with WTC dust exceeds the cleanup benchmark for at least one COPC.

Panel Discussion

Gilman said that EPA is proceeding with securing funding for contractors to help recruit participants into the sampling program. He clarified that multiple contractors would be used for the different steps of the program. Joseph Picciano commented that it is important to be

transparent in the selection of contractors and that the scope of work involves the community. Gautier said that since so much depends on the contractors, they need to be provided specific direction and oversight. McVay Hughes asked EPA to not only consider cost when choosing the contractors. She noted that the lowest bidder may not necessarily be someone people will want to allow into their homes.

Lioy and Garvey (OSHA) commented on the importance of having confidence in the sampling and analysis methods. Lippmann and Sven Rodenbeck discussed the use of the HEPA vacuum as a valid method for dust sample collection. Lippmann suggested looking at the available literature, and Lioy suggested including supporting information in an appendix. Meeker noted that until the analytes are determined, it will be difficult to identify the correct sampling method.

Krish Radhakrishnan had raised the issue of air sampling (specifically, for asbestos) at a previous panel meeting. He thought it would be a good way to assure the air is safe after cleanup is completed. However, Lippmann said it would be better to use the same method after the cleanup that was used initially to trigger the cleanup. Further, most panel members did not think that air sampling would be the most protective sampling method because three years have elapsed since the WTC attack. Prezant highlighted that it is important to make it clear why air sampling was not chosen. Not only is dust sampling a more protective method, but air sampling is more intrusive to the resident.

A community member and McVay Hughes asked for clarification about the three times background cleanup criteria. Gilman explained that the Superfund Program has previously used three times background as a screening level. This clarification sparked confusion about whether a unit with concentrations three times above background levels would be considered a Superfund hazard. Gilman and Stellman explained that this is absolutely not the case and that the Superfund Program was only mentioned to justify the choice of using three times background levels. McVay Hughes suggested and Stellman agreed that this is a perfect example of the need for a communications expert to review the monitoring proposal so that "charged" terminology can be removed. Lioy also stressed the importance of having clear language to reduce the potential for misinterpretation.

Prezant suggested that there should be a statistical test of the samples (perhaps based on distance from the WTC) to confirm that three times the background levels is a valid cleanup criterion. Stellman agreed that there should be further verification that three times background is an appropriate benchmark. In response to a comment from Stan Mark (community member), Stellman also wondered whether there is a scientifically valid way to have a health-based framework. Newman asked whether there would be any circumstances in which three times background would exceed a health-based benchmark. Gilman and Lioy responded that only PAHs have health-based benchmarks for dust, and that until the WTC background data are analyzed, it is unknown whether three times background will exceed these health-based benchmarks. Prezant suggested using the more protective cleanup criteria, so that if the health-based benchmark is lower than three times background levels, the health-based benchmark will trigger cleanup. He also noted that if the WTC signature is present in the dust and the concentration found is "x" number of times above background, but below a health-based benchmark, then cleanup would also occur. Gilman commented that if a health-based benchmark

is available, he does not think there is justification to use any other (lower) criteria. In other words, if a health-based benchmark is available, it will serve as the cleanup criteria. However, if a health-based benchmark is not available, then three times background will serve as the cleanup criteria. Prezant responded that if the WTC signature is present, he would be more apt to support this approach. He suggested that if EPA decides to use this approach, the Agency should make sure the justification is clearly stated. Lippmann commented that in cases where ten times background, for example, does not constitute a health hazard, perhaps a cleanup criterion higher than three times background should be considered.

Newman remarked that it would be inappropriate to use occupational benchmarks as cleanup criteria. He read from an EPA Region 8 document that noted that occupational benchmarks are not applicable to office settings because the occupational standards assume that the worker has knowledge of the hazards, is properly trained, and actively participates in a medical monitoring program. Lioy agreed that office environments are different from industrial settings.

Marc Wilkenfeld expressed great concern over the letters that will be sent to residents who have contamination unrelated to the WTC. Gautier agreed that it would be unpalatable for a resident to receive a letter confirming contamination without offering cleanup. Lioy pointed out that PAH contamination could be related to smoking. Rodenbeck agreed that the letters should contain pertinent information for next steps, however, he pointed out that the letters will not be able to say whether there is a health hazard. The community clarified for the panel that the Department of Health does not sponsor cleanups for lead exceedances. The owner of the unit is required to remediate the situation and is responsible for the expense. Wilkenfeld firmly believes that if a COPC is found at a level that would adversely affect someone's health, the unit should be cleaned up, even if it means an added cost. This would be an incentive for people to allow sampling in their units. He also thought that cleanup could be offered, as a courtesy, to anyone who wants it, even if sampling does not indicate a problem. Prezant was concerned that this approach would go beyond a single unit and trigger a wider cleanup zone. He also felt that, in the absence of a signature, there would have to be tremendous proof to allocate WTC money for cleanup—the levels would have to reach health-based benchmarks.

Wilkenfeld also stressed the importance of properly conveying the message. He noted that people are going to be less concerned with the science behind the decisions (e.g., whether their dust matched the WTC signature), and more concerned with whether the levels found will cause them to be sick. Newman agreed that public health outreach and education are essential to the monitoring program.

Newman pointed out that landlords and employers seem to be making the decisions about whether to enroll in the sampling program or not. He was concerned how this might skew the results. McVay Hughes said that it is important to send a clear message that it is "a good thing" for people to participate in the monitoring program.

Newman presented data he obtained from the Department of Health's Web site. He made two main points: (1) that lead-based paint is not a significant problem in Lower Manhattan because that area has the lowest incidence of elevated blood lead levels in children when compared to the rest of the city (1995–2000), and (2) elevated lead levels were found in dust collected from two

academic institutions on Chambers Street that do not contain lead-based paint (post-9/11). He concluded that there is ample evidence to include lead as a WTC COPC. Lioy thought Newman presented a strong argument and suggested that lead should, therefore, be found in the WTC signature. Based on this information, Prezant proposed that, if lead levels exceed the cleanup criteria and the validated WTC signature is present, the unit should be cleaned up. Everyone on the panel agreed.

Radhakrishnan asked if it was possible to differentiate between WTC lead and lead-based paint. Lioy responded that the best scenario would be to determine that lead is part of the WTC signature. Meeker said that the percentage of lead in the WTC signature could potentially be determined. He asked what would happen if the percentage of lead found in the dust samples made it clear that another source had contributed to the elevated lead levels. Lippmann asked if microscopic analysis could determine the source of lead. Meeker and Lioy thought that it would be possible to conduct a secondary analysis for circumstances with questionable lead sources.

Wilkenfeld asked what would happen if samples from residences of two neighbors showed equivalent levels of contamination, but one showed the presence of the WTC signature and the other did not. Rodenbeck explained that the presence of the WTC signature will help determine the cleanup *zone*. Prezant replied that, if enough apartments in the building have the signature (i.e., the building meets the decision criteria) and exceed cleanup criteria, then cleanup will occur for that building/zone. If the neighboring apartment is in a building in a different zone, then one may be cleaned while the other is not. Lioy reiterated that some of the implementation decisions will have to rely on professional judgment. McVay Hughes commented that the issue is further complicated by the fact that each apartment experienced different conditions, such as how well it was cleaned post-9/11, what side of the building the apartment faces, whether the windows were new or old, and whether the windows were open or closed. One community member requested additional feedback on the criteria for when whole building cleanup is warranted.

Gautier commented that the criteria for each phase need to be better defined. A large task is to determine the decision flow chart. Gilman replied that, while EPA will try to give as much certainty as possible to those people who agree to sampling, it is hard to think of every hypothetical scenario and plan a response for each. Until the data are collected and analyzed, EPA will not know exactly what the next steps will be. He suggested that once the data are collected, EPA talk to the panel and the community in an open process to collaboratively determine next steps. Stellman commented that this reinforces the need for clear communication between EPA and the community, since the community does not want to allow sampling without clear decision guidelines. One community member encouraged EPA to not set an impossibly high bar for building cleanup.

Lioy commented that NYC and the local agencies should reconsider their position on Brooklyn being part of Phase II, rather than Phase I. Gautier agreed that the extent of the plume is not fully defined until Brooklyn is tested.

Wilkenfeld felt that it is important to know whether there are any health risks associated with children playing in the city parks, and asked whether this was within the scope. Gilman said that topic has not been discussed. Jessica Leighton and McVay Hughes commented that some park

owners are more conscientious about sampling and have tested the sand periodically. No one was aware of whether the Parks Department was addressing the issue.

Due to elevated levels of antimony being found in fire fighters' blood, Prezant proposed adding antimony as a COPC. Lioy noted that antimony is not, however, a COPC. He suggested it be analyzed as part of the WTC signature, but not as a COPC. However, a community member pointed out that a number of peer reviewers thought that antimony should have been included as a COPC. Meeker suggested that antimony could be analyzed during a second tier. Lioy suggested leaving it to EPA to decide whether to include antimony in the signature and/or as a COPC.

McVay Hughes pointed out a discrepancy between the dioxin exceedances found during the 2002 EPA Indoor Air Cleanup Program and those found at Deutsche Bank. Due to this, she suggested conducting occasional dioxin sampling.

Newman commented that the heating, ventilation, and air conditioning (HVAC) sampling approach (Section F) does not currently mention that dead spots in mechanical areas are the most likely places to find WTC contaminants.

Lioy concluded that, with some minor modifications, the panel is in a position to tell EPA to move ahead and release a revised draft of the proposed monitoring program to the community, with enough time for them to review the document before the next panel meeting on November 15th. He also encouraged EPA and the community to meet before the next panel meeting to discuss the community's comments on the document.

6. HUMAN HEALTH EFFECTS PANEL

6.1 Analysis of WTC Dust Plume

Paul Lioy, Professor of Environmental and Community Medicine at the Environmental and Occupational Health Sciences Institute of the Robert Wood Johnson Medical School-UMDNJ and Rutgers University

The morning public comment session was extended. Therefore, in the interest of time, Lioy did not present at this meeting.

6.2 Asthma in New York City's Chinatown After 9/11

Anthony Szema, SUNY Stony Brook Medical Center

Anthony Szema presented background information on the composition of dust and smoke aerosol from the collapse of the WTC. He specifically mentioned endotoxin, which is released by bacteria and is naturally found in dust. Dr. Szema also reviewed the results from several related studies. He commented that there is a concern that inhalation of contaminants in the plume could have triggered pre-existing diseases.

Dr. Szema's research was a retrospective chart review of "crude" health services resource utilization for asthmatic Chinese-American children living in New York City, who visited the

Charles B. Wong Community Health Center (which is located in Chinatown about 1.5 miles from the WTC). He compared the number of visits to a doctor for asthma, the number of asthma medication prescriptions, the use of oral corticosteroids, the number of weekly doses of a rescue inhaler, and the peak expiratory flow rates for pediatric, asthmatic patients visiting the clinic at least once the year before and at least once the year after the WTC attack. The patients were stratified according to those who live within five miles of the WTC and those who live farther than five miles from the WTC.

The data showed that asthma clinic visits and asthma prescriptions increased significantly after 9/11. The number of children with asthma increased 66 percent and pediatric asthma visits increased 48.8 percent. The data were statistically significant for patients living within five miles from the WTC, but were not statistically significant for patients living farther than five miles from the WTC. Mean percent predicted peak expiratory flow rates decreased solely for those patients living within five miles of the WTC after 9/11. Dr. Szema also obtained the same asthma information for Chinese-American children visiting a clinic almost 12 miles away. For this control population, the number of children with asthma decreased 10.9 percent and the number of asthma visits decreased 13.6 percent. He concluded that asthma severity worsened after 9/11 for pediatric asthma patients living near the WTC, and residential proximity to the WTC was predictive of the degree of decrease in asthma health.

Panel Discussion

Szema discussed two studies which indicate that individuals have different variations of immune system receptors that may or may not cause airway hyper-responsiveness or sepsis from endotoxin exposure. He said that higher concentrations of endotoxin are found in larger amounts of dust. Lippmann expressed disbelief that high amounts of endotoxin would have been produced during the collapse of the WTC, due to the abiotic and alkaline conditions. Prezant proposed that initially there may not have been high amounts of endotoxin, however, when the dust settled it created a media for endotoxin development. Szema agreed.

Several panel members discussed using endotoxin in the WTC signature. However, because endotoxins are found everywhere (including sterile environments) and have been increasing in concentrations since 9/11, Prezant thought it would not be feasible to include them in the signature analysis. Lioy commented that endotoxin exposure may be related to exposures associated with post-9/11 fires rather than the initial dust or smoke released during the first three days.

Szema clarified the results from a case study that found silicates in the lungs of a person who developed acute lung disease. In the absence of determining that disease onset was the result of any known cause, they assumed it might be related to the WTC collapse. The concern is that a combination of environmental and genetic factors may predispose a person to get this rare disease. Szema noted that determining health effects is a complex issue, since WTC-related exposures may have sensitized people to other environmental antigens.

7. BRIEFING ON GAO TESTIMONY ON SEPTEMBER 11: HEALTH EFFECTS IN THE AFTERMATH OF THE WORLD TRADE CENTER ATTACK

Janet Heinrich, Director of Health Care, Public Health Issues, Government Accountability Office (GAO)

Janet Heinrich explained that Congress asked the Government Accountability Office (GAO) to describe the health effects that have been observed in the aftermath of the WTC attack and to describe efforts that are in place to monitor and understand those health effects. The GAO found that a variety of physical health effects have been reported in the scientific literature, including a range of respiratory conditions. Mental health effects, including post-traumatic stress disorder and depression, were not only observed in NYC, but also nationwide. Six federally funded programs were established to monitor and understand the health effects from the attack:

- WTC Health Registry, NYC Department of Health and Mental Hygiene
- Fire Department of New York (FDNY) WTC Medical Monitoring Program, FDNY Bureau of Health Services
- WTC Worker and Volunteer Medical Monitoring Program, Mount Sinai's Irving J. Selikoff Clinical Center for Occupational and Environmental Medicine
- Medical monitoring program for New York State workers, New York State Department of Health
- WTC cleanup and recovery worker registry, Johns Hopkins Bloomberg School of Public Health
- WTC responder screening program for federal workers, Department of Health and Human Services' Federal Occupational Health Services

The six programs vary in terms of eligibility, methodology for collecting health effects information, treatment referral options, and length of monitoring. All but one of the monitoring programs—the WTC Health Registry—focus on responders. Even though experts have cited that long-term monitoring is needed, the programs' funding may not extend beyond 2009. Some additional concerns are that the full health impact of the WTC attack is not known and that the monitoring programs may not be in place long enough to adequately capture information about conditions that occur decades after the exposure. Nevertheless, Heinrich concluded that these programs are providing a more complete picture of the health impact of the WTC attack and are also providing opportunities to identify people who need treatment.

Panel Discussion

In response to a question by Prezant, Heinrich replied that there are no formal recommendations in the GAO report. However, one "hidden" recommendation is that the programs need to continue for extended periods of time to ensure that the data are useful. She also commented that one deficiency is that the programs do not have a central point of coordination, although some are starting to collaborate. Gilman pointed out that, contrary to the GAO's statement about this being a deficiency, the Office of Science and Technology Policy's Committee on Environment and Natural Resources began tracking the federal programs.

Lioy was very concerned that the GAO report did not include research by several key investigators and scientists. He said that some of the best hospitals and doctors worked together after the WTC attack to determine immediate health impacts, which is not mentioned in GAO's report. Lippmann thought that the work by the National Institute of Environmental Health Sciences should have been included. Gilman noted that several EPA studies are also not included. McVay Hughes pointed out that by not including Dr. Reibman's study, there is a gap in the report, since hers is the only study that focuses on the residents. Heinrich explained that the GAO report was not intended to be a comprehensive review of all health effects research. It focuses on the six major, ongoing monitoring programs. She acknowledged that there are many other studies that address various aspects of health effects and that they are listed in the bibliography. One community member commented that it would not be practical to expand the report to include all studies.

Prezant congratulated the GAO on an outstanding effort. Newman also thought that the report took a big step forward by providing a good overview of the available programs and highlighting the deficiencies of those programs. Lippmann, however, commented that the report does not address the programs' deficiencies adequately. He encouraged people to write to Chairman Davis of the House Committee on Government Reform to make them aware that there is additional information beyond what is provided in the GAO report.

One community member commented that she understood that, because of limited time and money, the GAO report was not comprehensive. She asked if it would be possible to now go back and look more deeply at the six programs to assess the quality of each so that additional money is spent where it can do the most good. Heinrich replied that GAO could do so, if requested by Congress. Prezant wondered whether it would be possible for EPA to partner with GAO to expand the report to include additional evaluations (e.g., outcomes of volunteers versus trained employees). Gilman and Heinrich replied that only Congress can make requests of GAO; EPA cannot.

Prezant stated that successful monitoring and treatment is best done on the local level, where there is credibility and long-term ties to the community. He said that, as part of homeland security preparation, the federal government should pre-identify multiple organizations in each local and have pre-positioned proposal approvals and funding mechanisms in place. He said that this is especially important for residents because they have no umbrella health organization. Gilman reassured him that the Subcommittee on Toxics and Risk Assessment met two weeks ago and began looking into pre-positioning proposal approvals and longer-term funding, so that delays can be avoided during the next event.

In response to questions from Picciano, Heinrich said that she has reviewed a draft of the National Response Plan. She supported Prezant's observations about the local level and was encouraged by the progress that is being made at the federal level. She noted that a common GAO finding is "while there has been progress, more still needs to be done."

Even though Heinrich was not prepared to talk about a second GAO report on workman's compensation, Newman wanted to point out that many workers and volunteers are having

difficulty receiving medical treatment, and this should be a concern for the panel as an unmet public health need.

Prezant noted one advantage of the FDNY and Mount Sinai programs is that treatment is available. He said that monitoring without treatment can be very frustrating. He also felt very strongly that the WTC volunteers have been largely ignored and questioned the government's responsibility to them, since they received no training or monitoring. Lioy added that there is an enormous need for appropriate planning to attempt to minimize the potential casualties during the second phase (the first phase being the actual event) of the next event.

8. PUBLIC COMMENTS

Two public comment sessions were held during the meeting: from 11:10 a.m. to 12:45 p.m. (scheduled from 11:00 a.m. to 12:00 p.m.) and from 4:45 to 5:20 p.m. (scheduled from 4:10 p.m. to 5:00 p.m.). The following members of the public made comments to the panel:

- Barbara Caporale
- Mike Edelstein
- Kimberly Flynn
- Joan Greenbaum
- Harriet Grimm
- Robert Gulack
- Deb Hanna
- Rachel Lidov
- Scott MacCleod
- Stan Mark
- Caroline Martin
- Suzanne Mattei
- Phil McCall
- Mary Mehia
- Jenna Orkin
- Mary Perillo
- Jo Pollett
- Pamela Vasenas

Comments received in writing are provided in Attachment B.